Topics

- Recent climate history.
- The flood.
- Where we are now.
- Climate outlook.
Fall recap

- Temperatures averaged 1°-2°F degrees below normal for SON. Strongest departures in the east and Kimball Co.

- A general wet pattern, driest for Panhandle and portions of central and northern Nebraska.

- Snow season began early for southeast Nebraska.
Winter recap

- Cool trend continued and strengthened from the fall. Temperatures averaged several degrees below normal for DJF.

- Snow was generally plentiful.
  New snow records:
  Lincoln 55.5”
  Omaha 46.1”
February

- Third coldest February in the U.S.
- Nebraska ~11°F below average, 8th coldest on record.
- General cool and wet pattern. Dry pocket in the Panhandle and southwest.
Winter cattle stress

• Reports from Extension of the need to identify potential for cattle stress.

• Information sent to USDA to supplement Livestock Indemnity Program criteria.
February trends

FEBRUARY AVERAGE TEMPERATURE (°F)
NEBRASKA CLIMATE TRENDS

These maps show the climate trends over the long term and short term for the state's eight climate divisions based on industry-standard data from the National Centers for Environmental Information of the National Oceanic Atmospheric Administration. Long term trends use data collected between 1895 to 2016; short-term trends use data from 1987 to 2016.
February trends

FEBRUARY PRECIPITATION (IN)
NEBRASKA CLIMATE TRENDS

These maps show the climate trends over the long term and short term for the state’s eight climate divisions based on industry-standard data from the National Centers for Environmental Information of the National Oceanic Atmospheric Administration. Long term trends use data collected between 1895 to 2016; short-term trends use data from 1987 to 2016.

Long-term rate of change
Per decade

Short-term rate of change
Per decade

Nebraska State Climate Office
2018
Setting the stage for March floods

Antecedent conditions were critical...

- Soils at or near saturation and frozen.
- Rivers and streams frozen.
- Several inches of water in the snowpack.
Along comes a late winter storm

- Mid-latitude cyclone rapidly intensified.
- Consistently in model runs ~10 days in advance.
- Sustained high winds.
- Blizzard in the west, heavy rain in the east.

March 13, 2019

https://earthobservatory.nasa.gov
Extent of flooding

- Ice jams, snowmelt, heavy rain are contributors.
- Above flood stage for weeks.
- Record flooding at many locations.
- Damages estimated > $2B in Nebraska.
Impacts are wide-ranging

• State of Emergency declaration.

• Failure of Spencer Dam due to ice damage.

• 4 deaths; cattle losses; towns temporarily cut off; damage to homes, businesses, roads and fields; loss of stored grain; water quality concerns.
Impacts are wide-ranging
Reduction of impacts?

• Broad-scale event that identified **weaknesses**
  o **Gaps in preparedness** and emergency operating plans
  o **Communication** of severity and taking action on the warnings

Nebraska Emergency Management, FEMA stakeholder meeting (Apr 24)
Reduction of impacts?

• **Snow control**
  Culverts blocked with snow and crop debris → clearing out in advance of event?

• **Ice control**
  Open up river channels at problem areas and choke points?
Spring recap

- Cool and wet overall trend continues through spring months.
- Flooding and associated logistical problems, at/near saturated soils, above normal rainfall amounts and rainy days all leading to planting delays.
- Nebraska faring generally better than surrounding areas.
May rains

Previous Month's Liquid Precipitation Total (inches)

May 2019

Lincoln

6.93 6.40

7.14

8.45 8.14

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Generated 2019-06-04 04:40 CDT
Precipitation forecast: Jun 4 - 11

[Map showing precipitation forecast across the United States]
Outlook: Jun 11 - 17
Outlook: Jun-Jul-Aug
% Change in Grassland Production (lbs/ac) this Summer, Compared to an Area’s 38-yr Average

For the 3 maps (scenarios) below: “If precipitation between now & Aug 31st is above (left map), near (middle), or below (right) normal, grassland production in your grid-cell will be ___% more or less than its 38-year average.”

Maps made May 28, 2019

If above normal May-Aug precip

If near normal May-Aug precip

If below normal May-Aug precip
Potential impacts going forward

- Of the corn emerged (~70%), most 2-4 leaf stage. Color improving but still yellow in saturated areas.
- Nitrogen losses and weed control issues.

**Scenarios**

> Cold June
Need a warm September and no early freeze to get a mature crop.

> Wet June and summer
1993 conditions possible with saturated soils and low oxygen.

> Hot and dry
Flash drought increases risk due to poor root structure.
Model Predictions of ENSO from May 2019

IRI/CPC

Nino3.4 SST Anomaly (°C)

OBSERVED      FORECAST